Data_Indicator Professional

User Manual

version   1.1x

release 16.02.2015 english
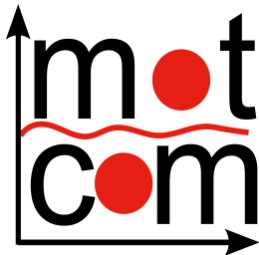
Contents

I. Introduction

Data_Indicator Professional is a PC application used in the BCom and OCom systems for displaying and analysing previously recorded BCom and OCom log files.

The Evaluator provides instant information on several important engine condition parameters. BCom Data Logger and OCom Logger programs constantly monitor and display this information, and record it into log files. If parameter values indicate a dangerous situation for the engine, it can be stopped through an alarm system or manually to avoid serious damages. At the same time, review and analysis of recorded log data give more detailed view on engine health.

II. Installation and setup

In order to install Data_Indicator on a computer with Windows operating system, double-click at setup.exe on a provided installation CD or other media. Follow the instructions in the setup program.

After the installation is finished, Data_Indicator can be started through a program group in Windows Start menu:

Data_Indicator_V1.10
Data_Indicator_V1.10
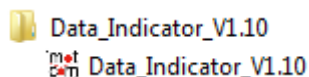
System requirements:

• Intel Core2Duo processor 2.66 GHz or higher

• CD-Rom drive, recommended CD-R/W drive

• min. 2GB DDR2 RAM

• hard disk with a capacity of min. 160 GB

• supports Windows XP, Windows Vista, Windows 7, Windows 8.x

III. Data reading and analysing

1. Main program window, BCom / BeCOMs mode

The main program window of Data_Indicator displays an empty graph after start. Use File / Load menu (chapter IV, 1) to open a BCom log file. Reading a large log file can take some amount of time, during which the data is added incrementally to the graph and the amount of read data in per cents is displayed at the bottom left corner of the main panel:
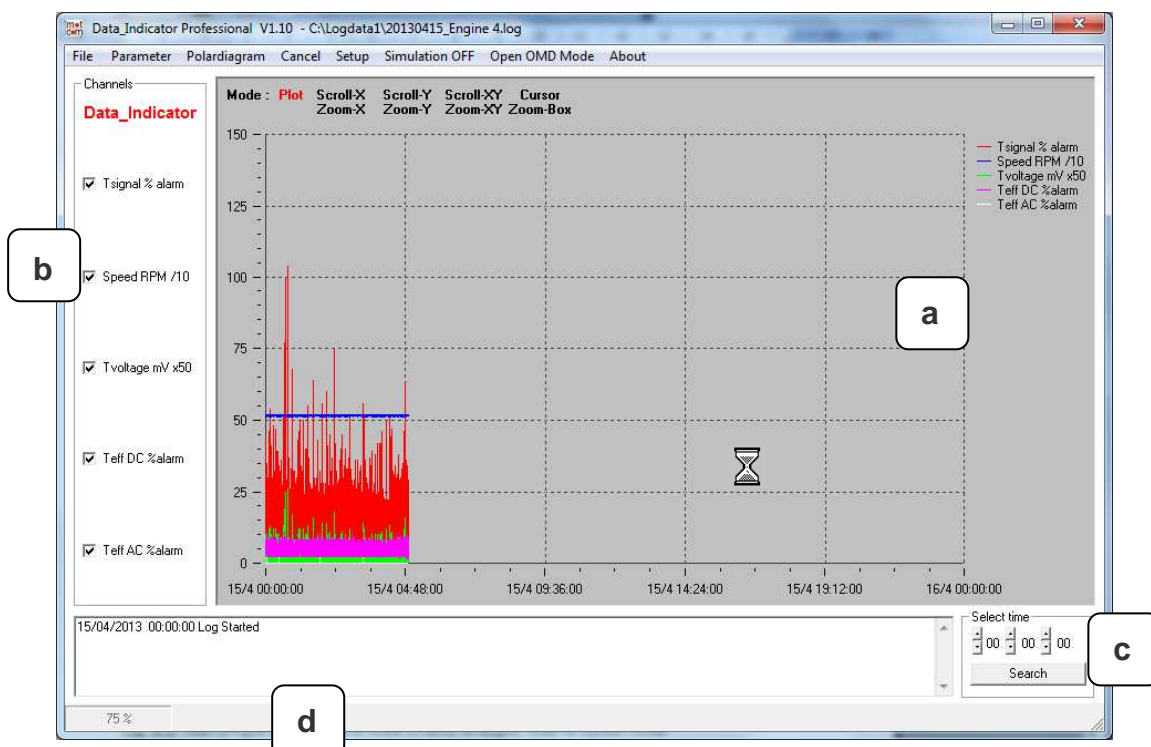

Fig. III-1. Main program window, loading a BCom log file

1.1. XY-Graph: a

The graph displays thermo voltage and engine rotation speed data:

Tsignal % alarm :   Thermo voltage in percents relative to preset alarm level
Speed RPM /10 :   Engine rotation speed in RPM divided by 10
Tvoltage mV x50 :   Absolute thermo voltage in mV multiplied by 50
Teff DC % alarm :   Effective value of thermo voltage in percents of DC alarm level
Teff AC % alarm :   Effective value of thermo voltage in percents of AC alarm level

Initially loaded, the data is scaled down so that the chart X-axis displays 24-hour interval starting from the first time stamp in the log file.
The graph has a set of options to navigate through the data and see detailed information at a certain time point (Fig. III-2).

Double-click on the graph to switch on/off its options.
Click an option to change the navigation mode of the graph.

Scroll-X (Scroll-Y):   scroll the graph along X- or Y-axis
Scroll-XY: scroll along both X- and Y-axis

To scroll, hold the left mouse button and move the mouse to the desired direction.

Zoom-X (Zoom-Y):   enlarge/shrink the graph along X- or Y-axis
Zoom-XY: enlarge/shrink along both X- and Y-axis

To zoom, hold the left mouse button and move the mouse to the right to enlarge and
to the left to shrink the graph in X-axis direction. Or, move the mouse upwards to
enlarge and downwards to shrink along Y-axis.

Zoom-Box: enlarge selected area of the graph. Hold the left mouse
                                         button and move the mouse to select an area. Releasing
                                         the mouse button stretches the selection to the frame of
                                         the graph.

Cursor: display the X and Y values of the selected plot point and
                                         open three additional windows: Detailed Display,
                                         Thermosignal difference diagram, and Speed difference
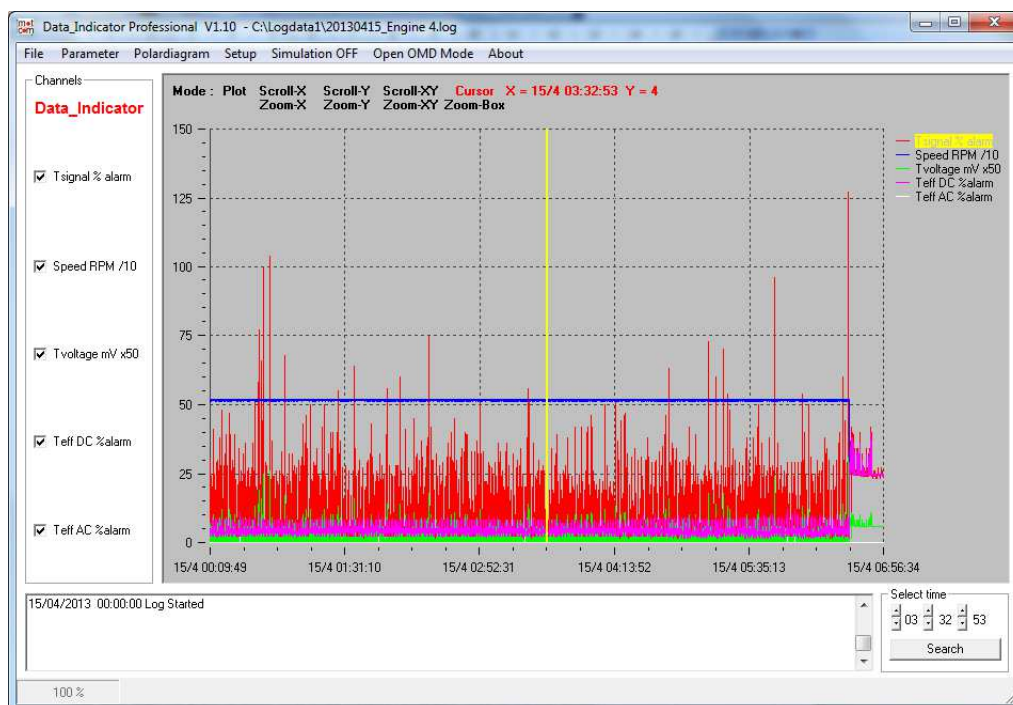   diagram (chapter I, 2, 3 and 4).

Fig. III-2. Main program window, time scale (X-axis) enlarged, chart in Cursor mode

Plot: return the graph to its default scale.

1.2. Displayed parameters: b

Tsignal % alarm :   display / hide thermo voltage signal in per cents at the graph
Sped RPM / 10 :   display / hide rotation speed signal
Tvoltage mV x50 :   display / hide absolute thermo voltage values (in mV)
Teff DC %alarm :   display / hide effective thermo voltage in % of DC alarm level
Teff AC %alarm :   display / hide effective thermo voltage in % of AC alarm level

1.3. Time selection: c

Allows to select a time point from the log file. Measurement data recorded at this point will be displayed in detailed display window, speed difference diagram and thermosignal difference diagram windows.

1.4. Event log window: d

Displays event messages and warnings recorded in the BCom data log file. Double-click anywhere at its field to open a larger window with event log ("Status window").
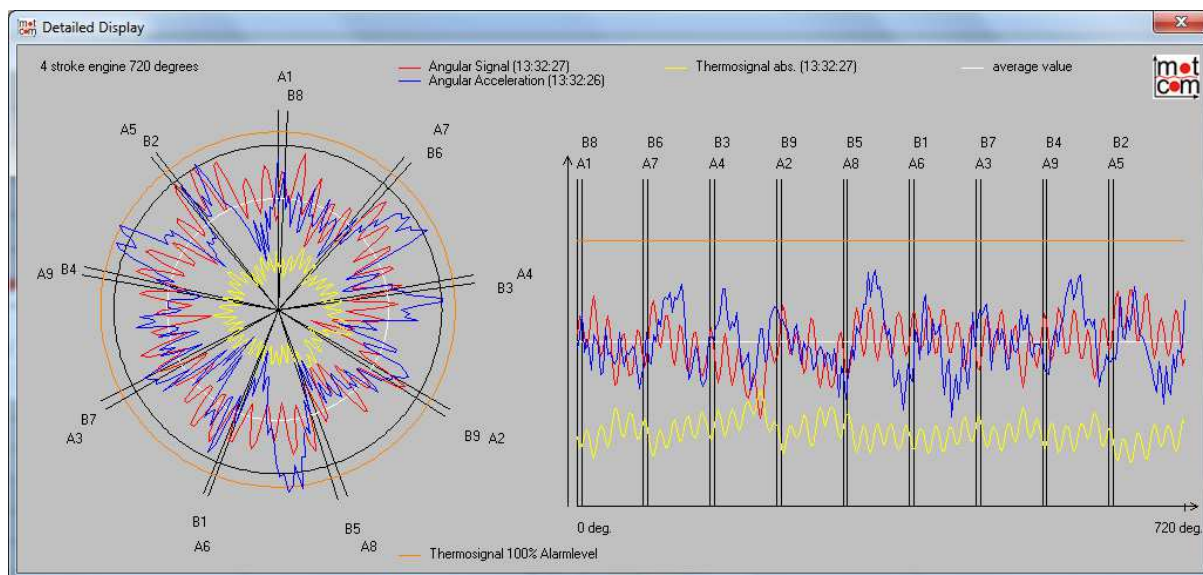
2. Detailed Display

Fig. III-3. Detailed Display

Open on Cursor command of XY-graph, Detailed Display window contains a polar diagram which plots thermo voltage and crankshaft angle acceleration in polar coordinates during the full combustion cycle nearest to the time point selected at the XY graph (chapter III, 1.1). At the right side of it there's an XY-diagram of the polar data with X axis representing the rotation angle.
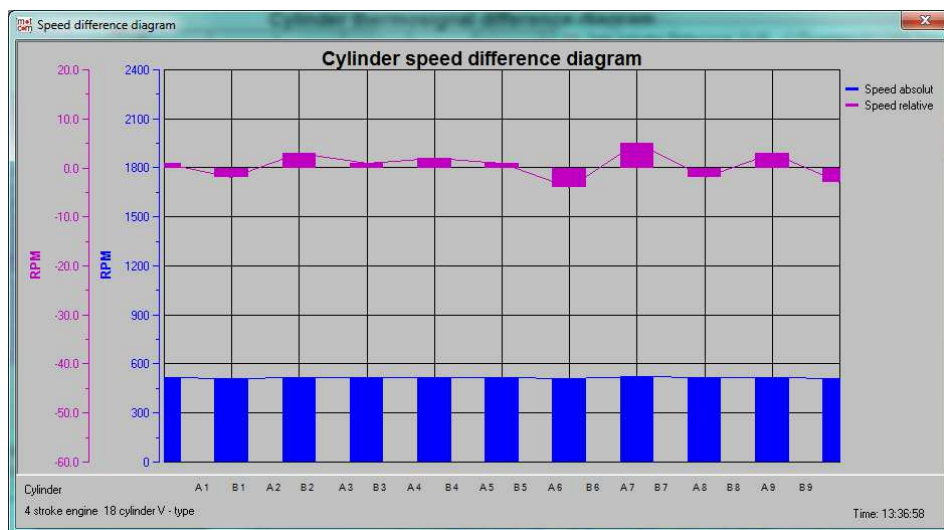
3. Speed difference diagram

Fig. III-4. Speed difference diagram

The diagram shows absolute cylinder speed (blue bars) and the difference between engine cylinder speed (pink bars) relative to the cylinder average speed during the nearest full combustion cycle.
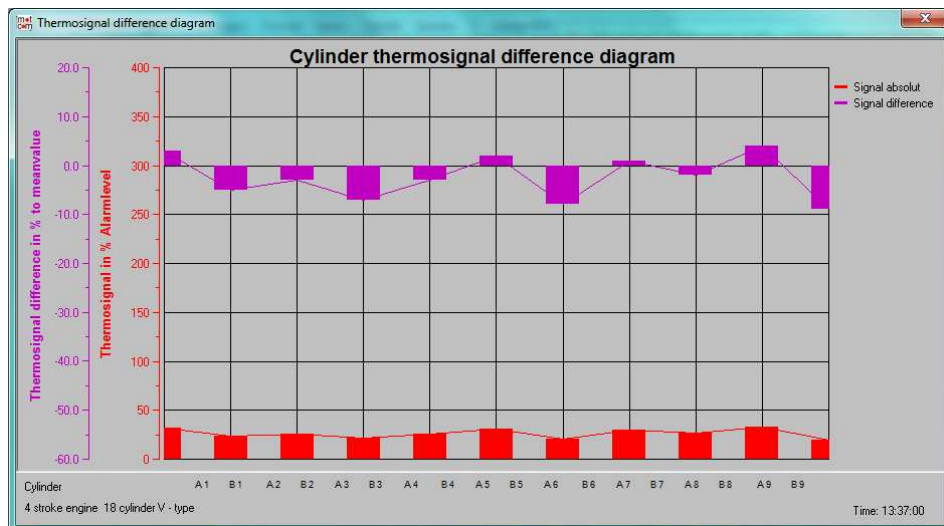
4. Thermosignal difference diagram

Fig. III-5. Thermosignal difference diagram

The red bars at the thermosignal difference diagram represent thermo signal in per cents of alarm level during the nearest full combustion cycle. The pink bars show this value relatively to the engine cylinder average thermosignal.

5. OMD Mode

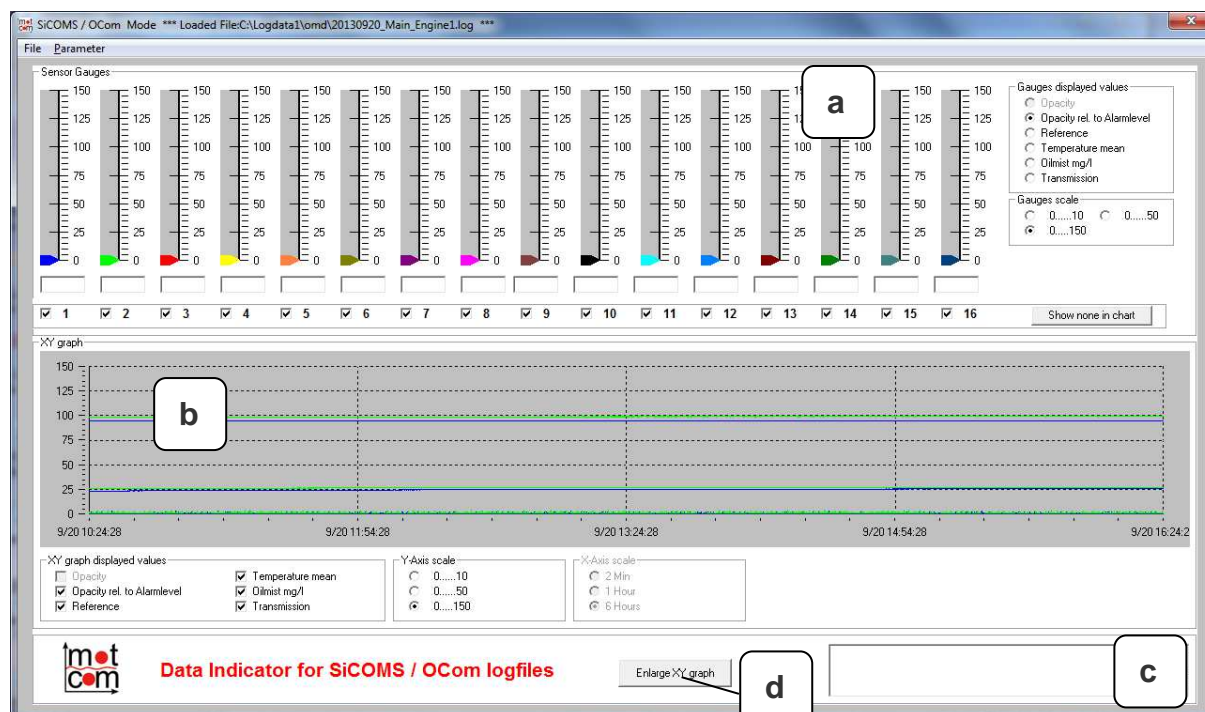OMD mode window allows viewing and analysing SiCOMS / OCom logfiles.

Fig. III-6. SiCOMS / OCom window with a loaded logfile
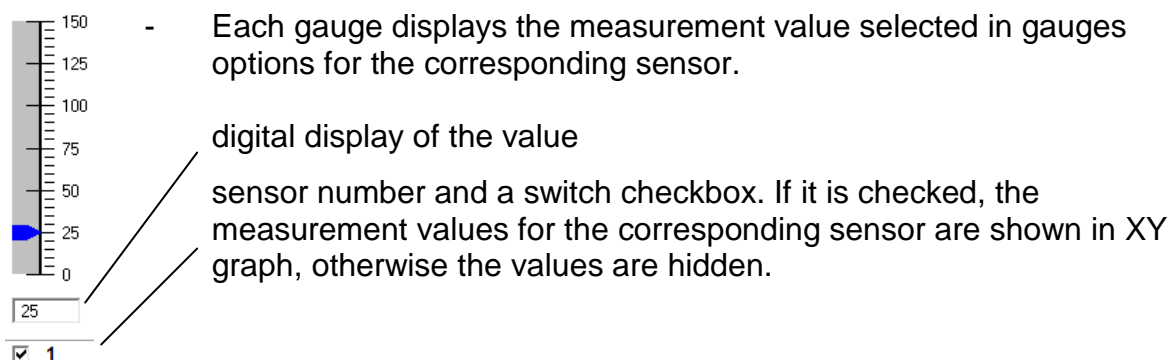
5.1. Gauges and options: a

-     Each gauge displays the measurement value selected in gauges options for the corresponding sensor.

digital display of the value

sensor number and a switch checkbox. If it is checked, the measurement values for the corresponding sensor are shown in XY graph, otherwise the values are hidden.

Fig. III-7. Gauge for sensor Nr. 1

The options for gauges include:

Fig. III-8. Gauges options

- the **"Gauges displayed values"** option allows to select which measurement value to show in the gauge. See chapter III, 5.2 for description of the values.
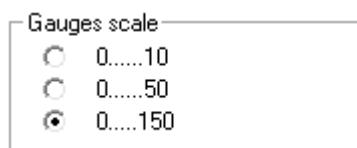

Fig. III-9. Gauges scale

- the **"Gauges scale"** option provides scale ranges for the gauges.

5.2. XY-graph and options: b

The XY graph displays measured data from the OMD logfile with time at X axis.
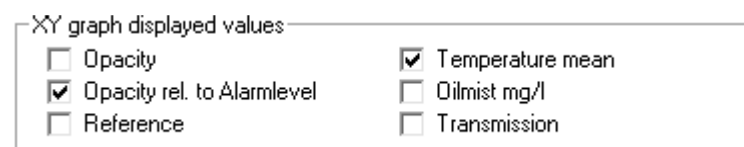See chapter III, 1.1 for description of navigating in the XY-graph.

XY-graph options

Fig. III-10. Options: XY graph displayed values

The **"XY graph displayed values"** option allows to select which values from the logfile should be displayed or hidden at XY graph.

Opacity :   opacity level in percents. 0% = transparent environment, infra red light beam reaches destination without loss; 100% = opaque environment, infra red light doesn't come through.

Opacity rel. to Alarmlevel :   opacity in percents relative to alarm level.

Reference :   basis value for calculating "Opacity" and "Opacity rel to Alarmlevel" values, given in digits.

Temperature mean :   sensor average temperature in °C

Oilmist mg/l :   absolute concentration of oil mist in mg/l

Transmission :   amount of light that reaches destination in the measuring unit of OMD sensor. Given in digits, a raw measurement value. Sensor initially calibrated in a transparent environment shows transmission about 1000 digits.
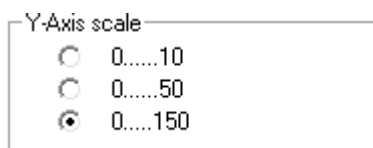
Fig. III-11. Y-Axis scale options

"Y-Axis scale" option sets the range to be used at the Y-axis. The same could be achieved through options menu inside the XY graph with "Zoom-Y" command.

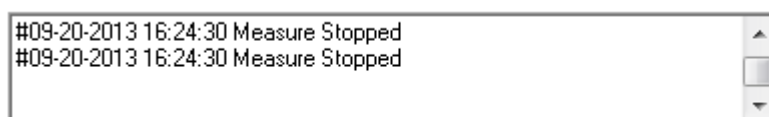## 5.3. Event log window (status messages):   c

Fig. III-12. Event log window

Displays event messages and warnings produced by the OCom / SiCOMS system during monitoring. Double-click anywhere at its field to open a larger status window with event log.
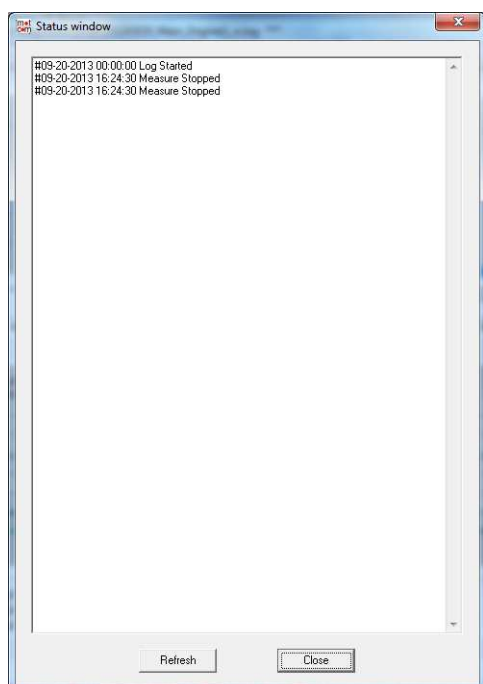

Fig. III-13. Status window

5.4. Enlarge XY graph button: d

pressing the button extends the XY-graph window. The button caption changes to "Reduce XY graph".
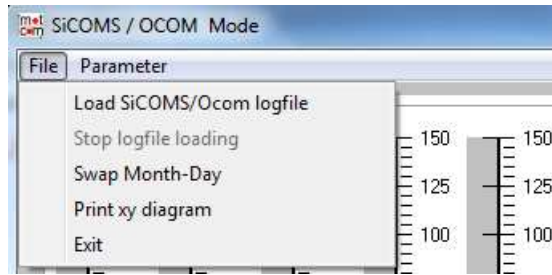
5.5. OMD mode: File menu

Fig. III-14. OMD File menu

5.5.1. Load SiCOMS/Ocom logfile

- opens a logfile recorded by SiCOMS or Ocom system.

5.5.2. Stop logfile loading

- cancels loading of the current logfile.

5.5.3. Swap Month-Day

- changes appearance of day and month in the date label at XY graph. Useful for some region/language Windows settings that have different date format than English/US Windows settings.

5.5.4. Print xy diagram

- this menu prints the current view of XY graph using standard MS Windows Print dialogue.

5.5.5. Exit

- closes the OMD mode window.

5.5.6. Parameter

- opens a window with Evaluator version info:
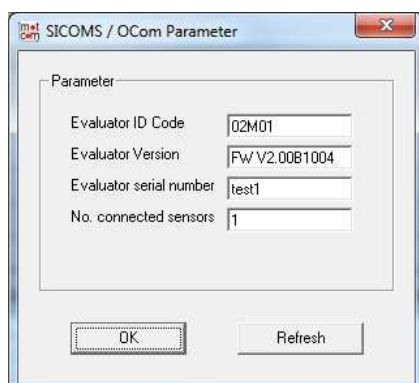

Fig. III-15. OMD File menu

IV. Menus

On program start, before a logfile loaded, the main menu has five items:

File   Setup   Simulation OFF   Open OMD Mode   About

After loading a BCom data file the main menu is extended:

File   Parameter   Polardiagram   Setup   Simulation OFF   Open OMD Mode   About
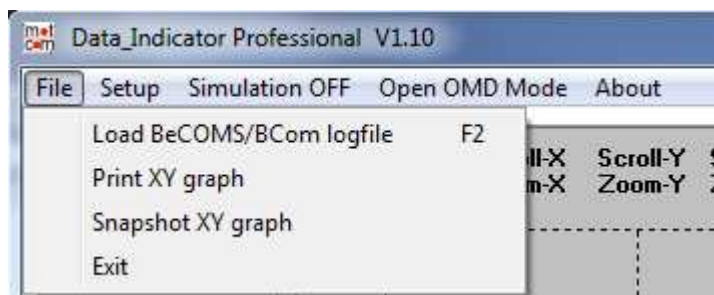
1. File menu

Fig. IV-1. File menu

1.1. File / Load BeCOMS/BCom logfile:
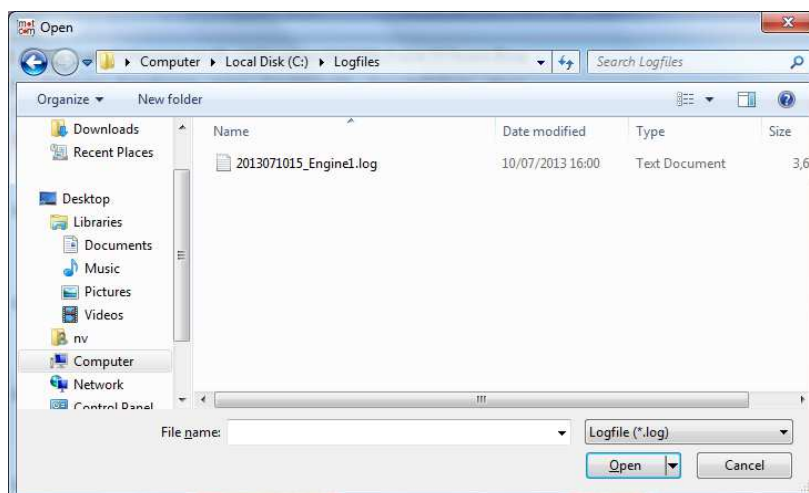
Select a BCom file in a standard Windows Open dialog:

Fig. IV-2. "Open" dialog

1.2. File / Print XY graph: print the current view of the XY graph using standard Windows Print dialog.

1.3. File / Snapshot XY graph: create a JPG image out of the current XY-graph view.

Type a file name for the JPG image in the standard Windows "Save As" dialog, then press "Save".
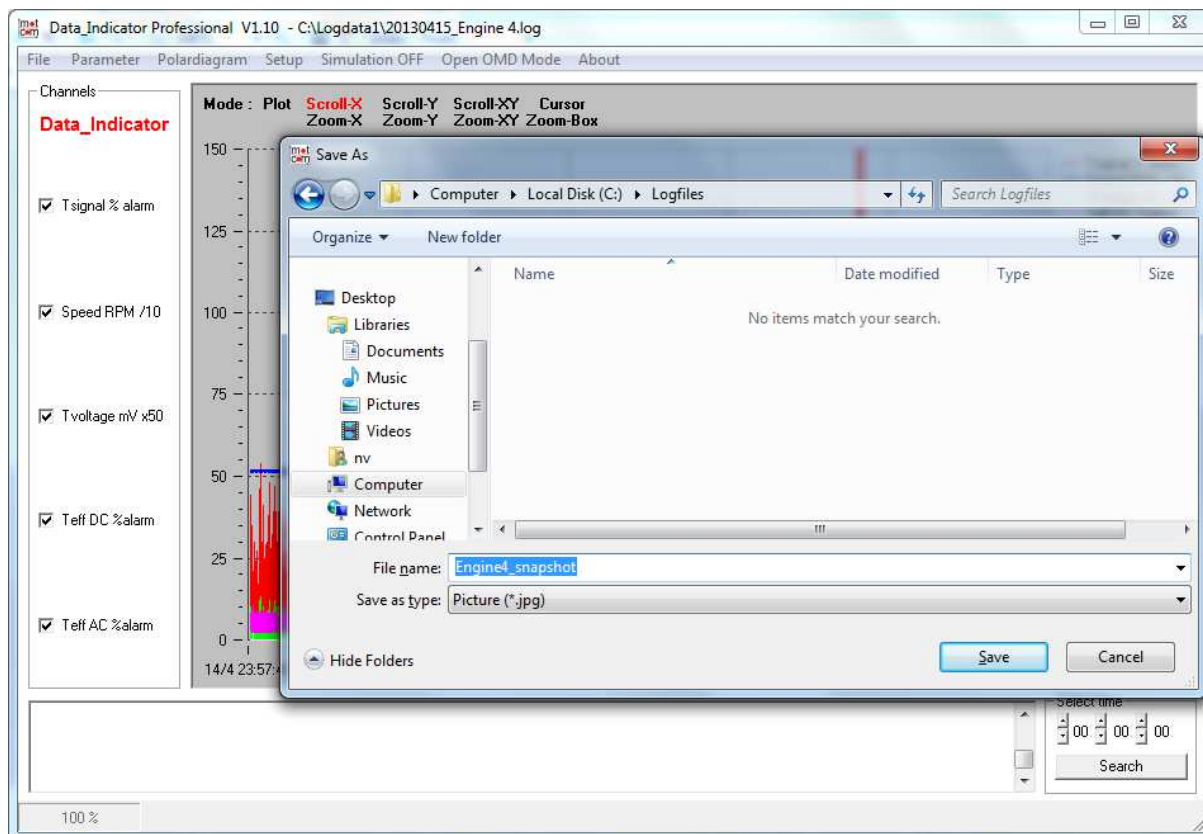

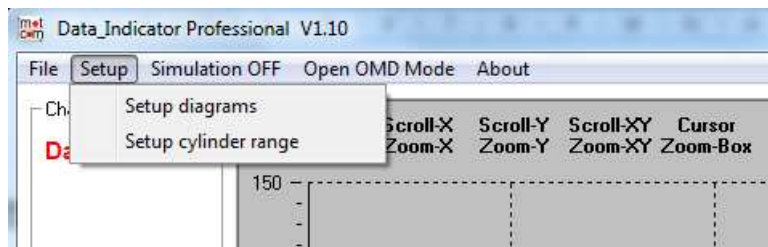Fig. IV-3. "Save As" dialog for menu File / Snapshot

2. Setup menu

Fig. IV-4. Setup menu

2.1. Setup / Setup diagrams: open the "Setup diagrams" window.
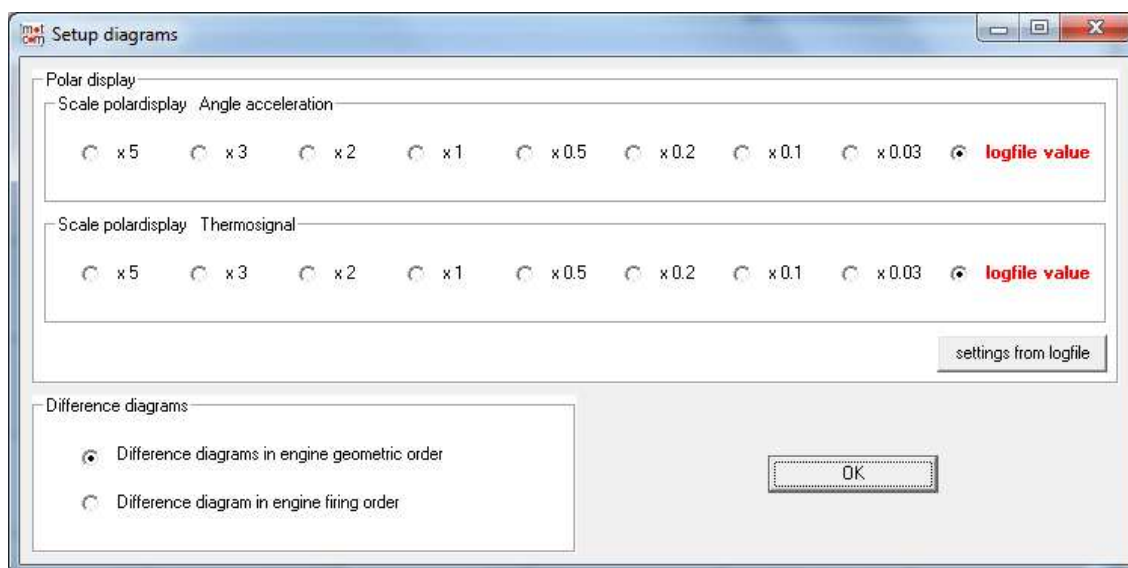

Fig. IV-5. Setup scale polardisplay

Scaling options for polar diagram ("Detailed Display" window, chapter III, 2):

- "Scale polardisplay Angle acceleration" option gives possibilities for scaling the angle acceleration signal

- "Scale polardisplay Thermosignal" is a scale factor for thermo voltage signal.

Difference diagrams (chapter III, 3 and 4) display option:

- "Difference diagrams": defines the way the cylinders are ordered at the difference diagrams.

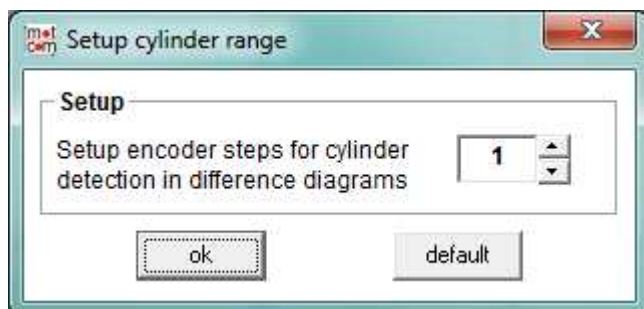## 2.2. Setup / Setup cylinder range:

Fig. IV-6. Setup cylinder range

The number inside the selection box defines how many steps of the total 256 steps in the full cycle should correspond to the top position of a cylinder during the combustion cycle. The value ranges between 1 and 10; it is used to adjust "the sensitivity" of signal localisation algorithm.

3. Simulation OFF / ON menu

The menu gives a possibility to scale the logdata values and so simulate different BCom Evaluator settings of DC alarm level.

DC alarm level +1 simulation
DC alarm level --1 simulation   – simulate increase / decrease of DC alarm level by 1 step and display scaled logdata. To actualise data view after changing alarm level, load the log file again.

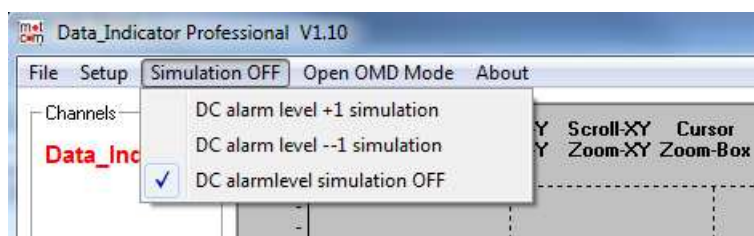DC alarm level simulation OFF   – display logdata without scaling

Fig. IV-7. Simulation OFF / ON menu

4. Open OMD Mode menu

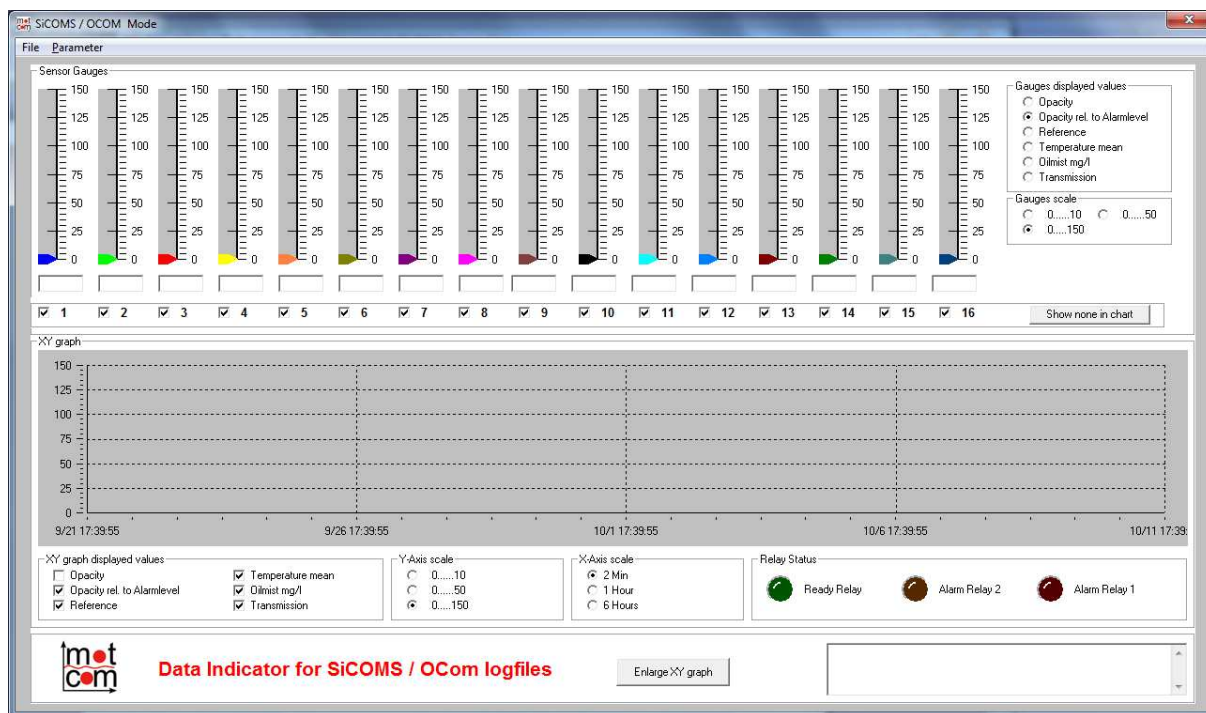The Open OMD Mode menu command opens a window for viewing SiCOMS/OCom logfiles.

Fig. IV-8. SiCOMS / OCom window

See "OMD mode" (chapter III, 5) for detailed description.
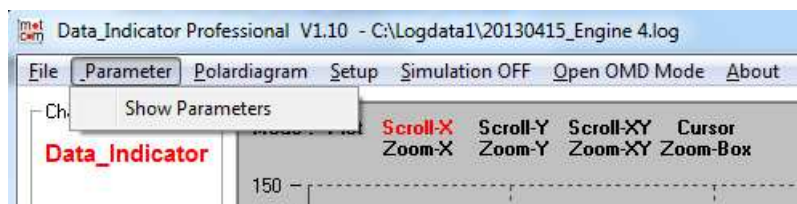
5. Parameter menu

Fig. IV-9. Parameter menu

This menu opens the Parameters screen which displays BCom Evaluator and engine parameter values that were set up at the time of log file recording.
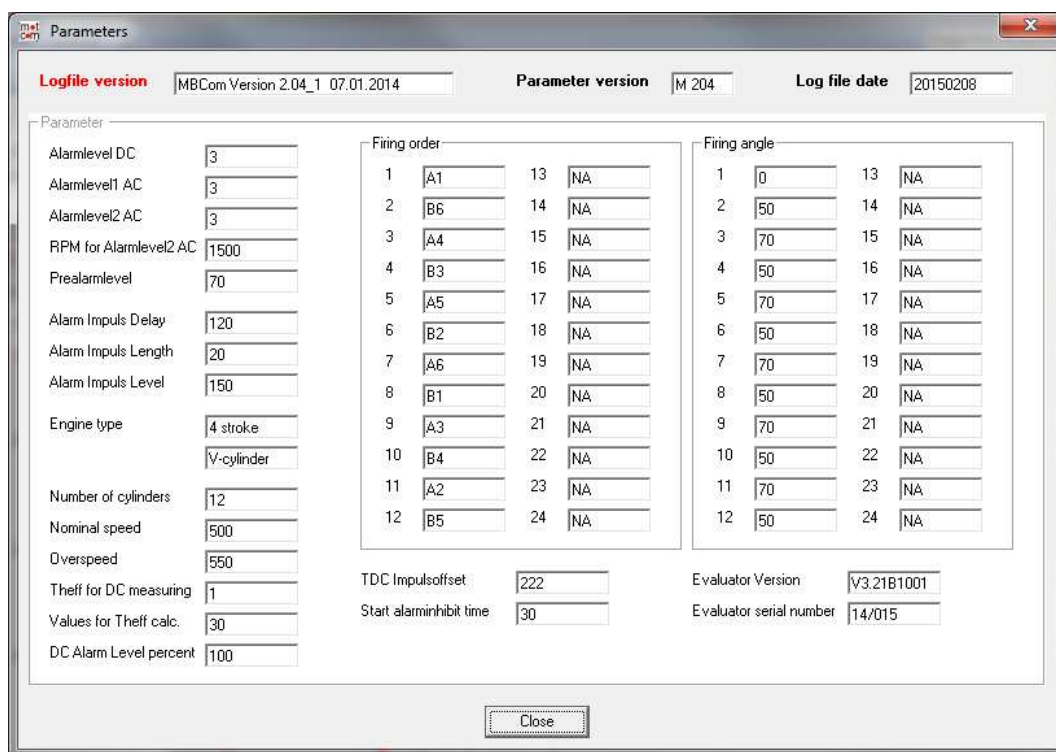

Fig. IV-10. Parameters screen
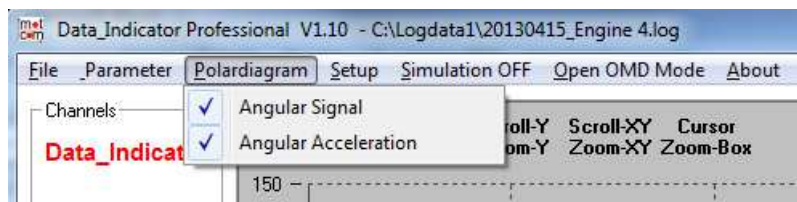
6. Polardiagram menu

Fig. IV-11. Polardiagram menu

Polardiagram menu options allow to display or hide the plot curves of angular signal (thermo voltage) and angular acceleration (rotation speed) at the polar diagram (Detailed display, see chapter III, 2).
If a menu item is checked, then the corresponding plot curve is displayed on the polar diagram, and hidden otherwise.